

## Flood stages during April, 1922—Continued.

## MEAN LAKE LEVELS DURING APRIL, 1922.

River and station.	Flood stage.	Above flood stages—dates.		Crest.	
		From—	To—	Stage.	Date.
MISSISSIPPI DRAINAGE—continued.					
Arkansas:	Feet.			Feet.	
Wichita, Kans. ....	9	9	10	9.9	9
Fort Smith, Ark. ....	22	10	17	27.8	12
Dardanelle, Ark. ....	20	11	18	25.2	13
Little Rock, Ark. ....	23	14	15	23.3	14
Pine Bluff, Ark. ....	25	14	17	26.0	16
Neosho:					
Neosho Rapids, Kans. ....	22	10	11	24.4	11
Le Roy, Kans. ....	24	9	11	27.4	9
Iola, Kans. ....	15	9	13	19.2	10
Oswego, Kans. ....	17	5	17	23.8	9
Wyandotte, Okla. ....	23	10	10	23.5	10
Fort Gibson, Okla. ....	22	10	17	30.0	11
	22	19	19	22.4	19
Cottonwood:					
Emporia, Kans. ....	20	10	12	22.9	11
North Canadian:					
Woodward, Okla. ....	3	5	10	3.4	8
	3	25	( <sup>2</sup> )	5.0	25
Canton, Okla. ....	3	26	26	3.7	26
Oklahoma City, Okla. ....	12	10	10	12.6	10
Petit Jean:					
Danville, Ark. ....	20	( <sup>1</sup> )	3	22.7	2
	20	6	9	22.6	7
Little Arkansas:					
Sedgwick, Kans. ....	18	23	9	23.5	9
White:					
Newport, Ark. ....	26	13	14	26.2	13-14
Georgetown, Ark. ....	22	( <sup>1</sup> )	24	23.9	6-9, 11, 15
Clarendon, Ark. ....	30	7	27	30.7	11-21
Black:					
Black Rock, Ark. ....	14	( <sup>1</sup> )	( <sup>2</sup> )	23.4	9
Catch:					
Patterson, Ark. ....	9	( <sup>1</sup> )	19	10.3	1
Sulphur:					
Finley, Tex. ....	22	( <sup>1</sup> )	16	26.4	2-3
	22	27	( <sup>2</sup> )	28.2	30
Ringo Crossing, Tex. ....	20	6	10	23.0	6
	20	26	( <sup>2</sup> )	23.8	28
Cypress:					
Jefferson, Tex. ....	18	2	8	21.6	4
	18	27	( <sup>2</sup> )	20.5	28
WEST GULF DRAINAGE.					
Sabine:					
Logansport, La. ....	25	( <sup>1</sup> )	( <sup>2</sup> )	34.7	2
Orange, Tex. ....	4	8	24	5.0	17
Neches:					
Rockland, Tex. ....	20	( <sup>1</sup> )	17	28.9	2
	20	29	( <sup>2</sup> )	21.7	30
Beaumont, Tex. ....	7	4	21	11.2	9-10
Trinity:					
Fort Worth, Tex. ....	30	25	26	39.1	25
	25	4	9	36.5	5
Dallas, Tex. ....	25	26	( <sup>2</sup> )	42.3	27
	28	6	17	38.3	11
Trinidad, Tex. ....	28	26	( <sup>2</sup> )	38.8	30
	40	9	16	41.7	9
Long Lake, Tex. ....	40	30	( <sup>2</sup> )	42.4	30
Liberty, Tex. ....	25	( <sup>1</sup> )	( <sup>2</sup> )	28.0	7-10
Brazos:					
Waco, Tex. ....	27	4	5	33.3	4
	27	27	27	30.4	27
Valley Junction, Tex. ....	44	5	7	49.4	6
	44	29	29	47.3	29
Washington, Tex. ....	45	6	10	49.9	8
Hempstead, Tex. ....	45	29	30	46.2	30
	40	8	11	42.7	9
Freeport, Tex. ....	4	13	14	4.2	13-14
	4	16	17	4.2	16-17
COLORADO DRAINAGE.					
Colorado (Texas):					
Austin, Tex. ....	18	27	( <sup>2</sup> )	21.2	28
Smithville, Tex. ....	24	30	( <sup>2</sup> )	24.1	30
	28	5	7	31.7	6
Columbus, Tex. ....	28	29	( <sup>2</sup> )	33.0	30
Guadalupe:					
Gonzales, Tex. ....	22	5	6	33.3	5
	22	29	29	25.2	29
	16	1	3	21.0	3
Victoria, Tex. ....	16	5	10	23.9	9
	16	30	( <sup>2</sup> )	17.2	30
Colorado:					
Lee's Ferry, Ariz. ....	12	26	( <sup>2</sup> )	13.6	30
North Fork of Gunnison:					
Paonia, Colo. ....	8	26	( <sup>2</sup> )	8.6	30

1 Continued from March, 1922.

2 Continued into May, 1922.

By UNITED STATES LAKE SURVEY.

[Detroit, Mich., May 3, 1922.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes. <sup>1</sup>			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during April, 1922:	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Above mean sea level at New York.....	601.45	579.93	572.35	246.06
Above or below—				
Mean stage of March, 1922.....	+0.10	+0.53	+0.96	+0.98
Mean stage of April, 1921.....	-0.24	-0.41	-0.44	-0.32
Average stage for April, last 10 years.....	-0.37	-0.45	-0.12	-0.35
Highest recorded April stage.....	-1.24	-3.30	-1.83	-2.37
Lowest recorded April stage.....	+0.91	+0.71	+1.09	+1.22
Average relation of the April level to:				
March level.....		+0.30	+0.70	+0.70
May level.....		-0.30	-0.40	-0.30

<sup>1</sup> Lake St. Clair's level: In April, 575.08 feet.

## EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, APRIL, 1922.

By J. WARREN SMITH, Meteorologist.

The first half of April was warm for the season in the Central and Eastern States, but unseasonably cool weather persisted west of the Rocky Mountains, while the latter half of the month was cool in the east, with freezing temperatures extending southward well into the Appalachian Mountain districts.

The unseasonably cold and stormy weather in the more Western States was decidedly unfavorable for stock in that section, especially for young lambs, and considerable loss was reported. The warm weather in Eastern States had forced a rapid development of fruit bloom, and early varieties were coming into blossom in districts that were visited by freezing temperatures and killing frosts the latter part of the month. Much damage was done to fruit in the upper Ohio Valley and the central Appalachian districts by the freeze of April 22-24. Additional damage occurred to fruit in these sections during the following week, being rather heavy in central Ohio and West Virginia, and to grapes and early cherries in New York.

The weather continued generally favorable for winter wheat and other fall-sown grains east of the Rocky Mountains. The mild temperatures and abundant moisture caused rapid growth of winter wheat, while the rains early in the month favorably affected this crop in the Southwest. There was too much rain, however, in some central districts; and much wheat land was flooded in many low sections, while plants continued to show lack of vitality and stood poorly in western Kansas, due to the previous long winter drought.

Seeding of spring wheat and spring oats was further delayed in central and northern districts by frequent rains, but there was a marked improvement in soil condition the latter part of the month, which permitted of much better progress, especially in some large oat-producing sections of the upper Mississippi Valley. Spring-wheat seeding was pushed during the last two weeks of

the month and at its close was nearly completed in the central and eastern portions of the belt.

The month was generally favorable for planting corn in the Southern States, and warmth was sufficient to cause satisfactory germination in most sections, although it was too cool the latter part of the month, particularly in the Southeastern States. The soil was wet and unfavorable for preparation of corn ground in the Central Valley States during much of the month, although fairly good progress was made in the Great Plains sections. Planting was well along at the close of the month as far north as central Kansas in the latter area, but this work was much delayed in central Valley districts. Conditions were more favorable for field work in the cotton States during the middle and latter parts of the month and cotton planting made fairly good progress. The nights were too cool, however, the latter part of the

month in most sections for rapid germination, while excessive rains west of the Mississippi River were detrimental. Beneficial rains occurred in southern Georgia near the close of the month. In eastern districts the crop had advanced to a stage where it was ready to chop out on the coastal plain of South Carolina, and planting progressed during the last decade of the month to the extreme northwestern portion of the cotton-growing section of Texas.

Truck was seriously damaged in Florida by prolonged drought, and growth was slow in southern California on account of cool weather. Grass and meadows made satisfactory growth with favorable weather conditions in nearly all central and eastern localities, but moisture continued deficient in the far Southwest, while more rain was needed in the extreme Southeast and some central and northern areas.

CLIMATOLOGICAL TABLES.<sup>1</sup>

## CONDENSED CLIMATOLOGICAL SUMMARY.

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

*Condensed climatological summary of temperature and precipitation by sections, April, 1922.*

Section.	Temperature.						Precipitation.					
	Section average.	Departure from the normal.	Monthly extremes.				Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.			Station.	Amount.	Station.	Amount.
Alabama.....	66.9	+3.7	Tuskegee.....	92	15	Valley Head.....	32	22	St. Bernard.....	8.14	Robertsdale.....	In.
Arizona.....	54.8	+1.0	Parker.....	96	22	Fort Valley.....	2	6	Ryan Ranger Sta.....	2.49	9 stations.....	0.00
Arkansas.....	63.2	+2.2	Huttig.....	90	7	Dutton.....	26	1	Spring Bank.....	12.81	Hardy.....	2.77
California.....	52.8	+1.1	Greenland Ranch.....	100	25	Fordyce Dam.....	-3	15	Mesa Grande.....	4.95	12 stations.....	0.00
Colorado.....	40.8	+2.2	2 stations.....	82	15	Silverton.....	-9	18	Long Branch.....	5.31	Saguache.....	T.
Florida.....	73.2	+3.4	2 stations.....	93	13	Wausau.....	38	5	Tallahassee.....	4.41	4 stations.....	0.00
Georgia.....	68.8	+3.4	St. George.....	98	14	Blue Ridge.....	28	2	Dahlonega.....	7.62	Tifton.....	0.30
Hawaii.....	70.9	+0.9	Mahukoua.....	89	30	Waimea.....	-48	24	Honolulu.....	23.49	3 stations.....	0.00
Idaho.....	39.7	-4.2	2 stations.....	79	21	Stanley.....	-14	16	Priest River Exp. Sta.....	3.59	Felt.....	0.28
Illinois.....	53.9	+2.1	Sparta.....	85	6	2 stations.....	24	1	Paris.....	9.93	Paw Paw.....	1.15
Indiana.....	54.3	+2.6	2 stations.....	88	17	Huntingburg.....	23	2	Whitestown.....	11.58	Hobart.....	3.13
Iowa.....	49.9	+1.2	Thurman.....	87	6	Boone.....	21	1	Algona.....	6.70	Inwood.....	1.04
Kansas.....	54.9	+0.8	Medicine Lodge.....	87	21	Tribune.....	15	11	Oswego.....	12.41	Ashland.....	0.92
Kentucky.....	59.3	+3.6	Williamsburg.....	88	14	Berea.....	25	2	Middlesboro.....	7.13	Irvington.....	2.68
Louisiana.....	70.5	+3.5	Coushatta.....	91	13	Calhoun.....	37	2	Conshatta.....	9.80	2 stations.....	1.59
Maryland-Delaware.....	54.0	+1.4	Hancock, Md.....	93	10	Oakland, Md.....	17	24	Oakland, Md.....	3.56	Baltimore, Md.....	0.88
Michigan.....	48.0	+0.6	Kalamazoo.....	84	10	Humboldt.....	7	1	Sack Bay.....	6.30	Iron River.....	1.50
Minnesota.....	43.0	+0.1	Beardsley.....	83	24	Warroad.....	7	1	Grand Meadow.....	4.19	Plympton.....	T.
Mississippi.....	67.7	+3.7	Okolona.....	91	7	Duck Hill.....	36	2	Myrtle.....	10.60	Columbia.....	1.90
Missouri.....	57.3	+1.9	Caruthersville.....	91	16	Bethany.....	24	1	Warsaw.....	14.34	Bethany.....	1.72
Montana.....	40.4	-3.9	Glasgow.....	83	22	Hebgen Dam.....	-10	15	Adel.....	5.92	Knobles Ranch.....	0.51
Nebraska.....	49.4	+0.2	Syracuse.....	87	6	Kimball.....	15	11	Hay Springs.....	6.28	Santee.....	0.34
Nevada.....	43.8	-5.5	2 stations.....	92	23	Owyhee.....	6	11	Hay Springs.....	3.30	Mina.....	0.00
New England.....	43.8	+1.0	2 stations.....	85	10	Somerset, Vt.....	10	2	Somerset, Vt.....	5.37	Rutland, Mass.....	1.13
New Jersey.....	51.0	+1.5	Pateron.....	89	10	2 stations.....	18	22	Hightstown.....	4.12	Woodcliff Lake.....	1.57
New Mexico.....	50.0	-0.8	Tularosa.....	89	25	Chama.....	4	15	Texico (near).....	6.63	3 stations.....	0.00
New York.....	45.3	+1.0	Mount Vernon.....	89	10	Indian Lake.....	3	4	Wanakena.....	7.02	Lauterbrunnen.....	0.44
North Carolina.....	60.4	+2.9	2 stations.....	96	13	Parker.....	23	23	Monroe.....	7.41	Panteo.....	1.54
North Dakota.....	42.3	+0.6	Mandan.....	89	23	3 stations.....	-2	18	Wahpeton.....	3.15	Madison.....	T.
Ohio.....	52.6	+2.6	4 stations.....	86	2	2 stations.....	20	22	Eaton.....	7.98	Godsall.....	1.73
Oklahoma.....	60.8	+0.8	Beaver.....	95	15	Goodwell.....	15	1	Antlers.....	13.00	Madras.....	0.18
Oregon.....	44.5	-3.2	The Dalles.....	83	23	Crater Lake.....	-3	17	Larch Mountain.....	10.75	Lancaster.....	1.28
Pennsylvania.....	50.1	+1.4	Gatysburg.....	91	10	West Bingham.....	11	22	Herr Island Dam.....	6.10	Garrett.....	0.82
South Carolina.....	64.5	+2.1	Garnett.....	95	14	Santuck.....	33	2	Landrum.....	8.30	Hermosa.....	4.34
South Dakota.....	48.0	+0.3	4 stations.....	81	14	Deadwood.....	9	17	New River.....	4.81	Covington.....	3.14
Tennessee.....	61.8	+3.6	Moscow.....	92	14	Mountain City.....	23	23	Weatherford.....	18.11	Meredes.....	0.00
Texas.....	67.6	+1.5	San Benito.....	107	10	Clint.....	23	19	Silver Lake.....	6.22	Kelton.....	0.12
Utah.....	41.5	-5.8	St. George.....	86	22	4 stations.....	0	19	Mendota.....	5.71	Manassa.....	0.82
Virginia.....	57.0	+2.5	2 stations.....	86	21	Burkes Garden.....	19	23	Cedar Lake.....	10.70	Wapato.....	0.00
Washington.....	45.4	-2.9	Granger.....	91	10	Lake Keechelus.....	9	12	Pickens.....	6.78	Upper Tract.....	0.50
West Virginia.....	54.4	+2.9	Moorefield.....	76	7	Cheat Bridge.....	15	24	Marshfield.....	5.62	Danbury.....	1.17
Wisconsin.....	43.3	+0.1	Racine.....	76	7	Long Lake.....	7	1	Dome Lake.....	6.36	2 stations.....	0.16
Wyoming.....	36.4	-3.6	2 stations.....	76	24	Lake Yellowstone.....	-19	17				

<sup>1</sup> For description of tables and charts, see REVIEW.

<sup>2</sup> Other dates also.